



PATENT

Att. Dkt. AMAT/5975.P1/CP/COPPER/LB/PJS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of:
Chang, et al.

Serial No.: 10/634,662

Confirmation No.: 6355

Filed: August 4, 2003

For: Ruthenium Layer
Formation for Copper Film
Deposition

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Group Art Unit: 1762

Examiner: Wesley D. Markham

MAIL STOP AMENDMENT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

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37 CFR 1.8

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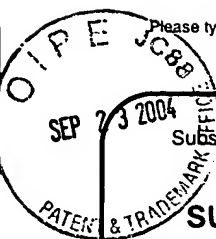
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Respectfully submitted,



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Sheet 1

of 1

Application Number	10/634,662
Filing Date	August 4, 2003
First Named Inventor	Chang, et al.
Group Art Unit	1762
Examiner Name	Unknown
Attorney Docket Number	AMAT/5975.P1/CPI/COPPER/LB/PJS
Submission Date	September 20, 2004

U.S. PATENT DOCUMENTS

Examiner Initials*	Cite No. ¹	Document Number	Publication Date MM-DD-YYYY	Name of Patentee or Applicant of Cited Document	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear
		Number-Kind Code ² (if known)			
	A1	US-6,713,373 B1	03/30/2004	Omstead	
	A2	US-6,605,735 B2	08/12/2003	Kawano, et al.	
	A3	US-6,479,100 B2	11/12/2002	Jin, et al.	
	A4	US-6,440,495 B1	08/27/2002	Wade, et al.	
	A5	US-2002/0173054 A1	11/21/2002	Kim	
	A6	US-2001/0006838 A1	07/05/2001	Won, et al.	

NON PATENT LITERATURE DOCUMENTS

Examiner Initials*	Cite No. ¹	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published	T ²
	C1	Aaltonen, <i>et al.</i> , "Atomic Layer Deposition of Ruthenium from RuCp ₂ and Oxygen: Film Growth and Reaction Mechanism Studies," Electrochemical Society Proceedings Volume 2003-08 pp. 946-953.	
	C2	Aaltonen, <i>et al.</i> , "Atomic Layer Deposition of Ruthenium Thin Films from Ru(thd) ₃ and Oxygen," Chem. Vap. Deposition (2004), 10, No. 4 pp. 215-219.	
	C3	Aaltonen, <i>et al.</i> , "Ruthenium Thin Films Grown by Atomic Layer Deposition," Chem. Vap. Deposition (2003), 9, No.1 pp.45-49.	
	C4	Aoyama, <i>et al.</i> , "Ruthenium Films Prepared by Liquid Source Chemical Vapor Deposition Using Bis-(ethylcyclopentadienyl)ruthenium," Jpn. J. Appl. Phys. Vol. 38 (1999) pp. L1134-L1136.	
	C5	Dadgar, <i>et al.</i> , "Growth of Ru doped semi-insulating InP by low pressure metalorganic chemical vapor deposition," Journal of Crystal Growth 195 (1998) pp. 69-73.	
	C6	Kwon, <i>et al.</i> , "Atomic Layer Deposition of Ruthenium Thin Films for Copper Glue Layer," Journal of the Electrochemical Society, 151 (2) (2004) pp. G109-G112.	
	C7	Kwon, <i>et al.</i> , "Plasma-Enhanced Atomic Layer Deposition of Ruthenium Thin Films," Electrochemical and Solid-State Letters, 7 (4) (2004) pp. C46-C48.	
	C8	Lashdaf, <i>et al.</i> , "Deposition of palladium and ruthenium β -diketonates on alumina and silica supports in gas and liquid phase," Applied Catalysis A: General 241 (2003) pp. 51-63.	
	C9	Lim, <i>et al.</i> , "Atomic layer deposition of transition metals," Nature Materials, Vol. 2 November (2003) pp. 749-754.	
	C10	Shibutami, <i>et al.</i> , "A Novel Ruthenium Precursor for MOCVD without Seed Ruthenium Layer," TOSOH Research & Technology Review, Vol. 47 (2003) pp. 61-64.	

Examiner

Date Considered

EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609. Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant. ¹ Applicant's unique citation designation number (optional). ² See Kinds Codes of USPTO Patent Documents at www.uspto.gov or MPEP 901.04. ³ Enter Office that issued the document, by the two-letter code (WIPO Standard ST.3). ⁴ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁵ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁶ Applicant is to place a check mark here if English language Translation is attached.

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